

Statistics Canada

Report on "Fundação Instituto Brasileiro de Geografia e Estatística"

Statistics Canada Mission, 26 August-9 September 1994.

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Rio de Janeiro, September 1994

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SECTION I - Introduction Statistics Canada Fifteen Years Ago

In 1979, Statistics Canada went through a period of intense internal and external difficulties as a result of which its staff showed signs of low morale, productivity dropped, and credibility with users reached a low point. The Government of Canada began to wonder publicly whether it was possible to keep the institution intact as an effective centralized collector and compiler of social and economic statistics of key use to Government and to Canadians at large. But in 1993, the British weekly *The Economist*, in reviewing the effectiveness of the most developed statistical offices in the OECD area, ranked Statistics Canada as for the second time running the world's leading statistical agency.

As with most changes of this order, luck had a role to play. But not an exclusive one. A number of initiatives developed by Statistics Canada's staff and leadership made this turnaround possible and sustainable. As a result, the senior staff of the agency finds itself today in the enviable position of both knowing how fragile the best of agencies can be in the face of outside threats and what mechanisms must be constantly invoked to prevent those threats from affecting the agencies status and integrity. It is this knowledge, more than any other, that the members of the Canadian mission brought to IBGE and it is this expertise which permeates their findings and resulting recommendations.

The principal resource of any institution is made up by its people - their dedication and loyalty, understanding of the purposes of the institution which they serve, readiness to adjust to different internal and external circumstances and above all imbued with a professional consciousness that makes their work objective and impartial and allows the agency to stand free of outside interference. Were it not for that, Statistics Canada would not be where it is today. But it is the mission's collective view that IBGE can count on thoroughly professional behaviour from its staff, that they are dedicated and loyal, eager to help improve their institution's standing and willing to learn from others ways to bring about such an improvement. It is upon such people that the success of future changes must be predicated.

The Canadian mission's objectives were primarily to understand current circumstances that affect several of IBGE's areas. Members of the mission found their counterparts open, receptive and capable of hard work. Most of all they found that in spite of morale problems, their loyalty to IBGE stood first and foremost among their concerns. They also found that none of their counterparts understood the role of a statistical agency differently from the way in which it is understood in Canada - as objective and impartial, scientific in its objectives and in the ways to attain them.

IBGE through Canadian Eyes

The members of the Canadian mission found that their impressions coincided in a number of essential points all of which they deemed important to the survival and the prospering of a government statistical office. They recognized in IBGE:

a lowering level of motivation on the part of the interviewed staff;

the absence of a good system of internal communications, particularly among the different constituent departments of the agency;

the lack of cost consciousness and of cost information;

the absence of a developed network of contacts with key data users;

the absence of a tradition of establishing effective inter-disciplinary project teams;

the reluctance to take on new responsibilities and to be accountable;

the absence of a commitment to deadlines; and

the failure to mobilize resources internally to face up to outside challenges.

The purpose of this report is to review how these findings affect distinct areas and to make concrete suggestions designed to improve matters both immediately and in the longer run. The suggestions are predicated on different assumptions. First, there are suggestions that can be carried out exclusively by IBGE, with no further budgetary help and in the short run. Those are obviously the most interesting ones even though they may entail some shocks to traditions and well established routines.

Secondly, there are those suggestions which are also implementable by IBGE and which are bound to take longer as they are the result of a cumulative process which requires continuity of purpose and perseverance in the face of repeated challenges and difficulties.

Next there are the contributions to such improvement that may be made by Statistics Canada some of which do not demand any additional financing and others that do. Among the first are whatever help Statistics Canada can provide through its own extensive network of contacts and through the documents and software which it has both authored and tested in the field. Also among this first set is Statistics Canada's help in any request that IBGE may wish to formulate in order to solicit financial assistance from international agencies of which Canada is a member.

Among the second are Statistics Canada's consulting missions, its training courses, its ability to train trainers, to host long term visitors and to provide members of its fellowship programme with the best conditions conducive to research in the social sciences.

But whatever policy IBGE adopts and whatever turn out to be its financial constraints, it is the opinion of members of the mission that all efforts should be directed towards:

the improvement of internal communications so as to foster the development of a more cohesive workforce;

the development of cost consciousness and cost information so that resources can be allocated rationally;
and

the fostering of a client orientation so that IBGE can build up its relevance, credibility and effectiveness.

A word about general findings

There are several that today appear intuitively obvious to anyone with more than fifteen years of service in Statistics Canada but which may be less so for outsiders. Practice has shown us that statistical tasks, unlike research and unlike many artistic endeavours, are the result of well disciplined, well coordinated and well led multidisciplinary efforts. The evidence suggests that the consciousness of this need does not exist today at IBGE. Experience has taught us that the habit of working in teams cannot be developed without a commitment to good communications - keeping each other informed both up and down the hierarchy as well as sideways- the habit of working under the leadership of a project manager, capable of managing having earned the trust of all, able to lead, decide and balance conflicting opinions, but not the hierarchical superior of any member of the team.

Statistics Canada has also found that, not surprisingly, people are motivated by rewards and deterred by costs. If the former do not exist and the latter are unknown, there are strong chances that perverse behaviour will be encouraged. For this reason a cost conscious culture has been fostered in the agency which finds no counterpart in IBGE. If that culture is not developed, stage by stage, the chances are that resources will be misallocated and downright wasted, with all the penalties that accrue when scarcity is mismanaged.

Statistics Canada found that when a statistical institution goes through a crisis it must have allies - those who are conscious of its longer term value and potential to contribute to the society in which it exists. But it takes time and effort to maintain a network of external allies for they must be given a reason and an interest to champion the agency's cause. While we do not doubt that IBGE has its champions we did not find in the course of our stay evidence that a network of outside contacts existed and was carefully maintained. Allies stand up for the integrity of an agency as well as provide it with guidance when it has to choose among conflicting priorities. If allies cannot be mobilized, precious advice is foregone at crucial junctures.

Finally Statistics Canada found that the credibility and the effectiveness of a statistical agency can only be maintained if it is service conscious and cultivates the interests and concerns of its clients. This means being responsive to client concerns; meeting their changing wishes in a timely way; and adjusting with wisdom the scale of the means allocated to the ends that must be attained. No such culture appears to have been developed at IBGE.

Solutions

These will not be found overnight. It took Statistics Canada much longer to implement them than to find them because large offices such as Statistics Canada or IBGE have their internal vested interests which tend to resist change. But Statistics Canada learned that no solutions would be found if all of its ills were blamed constantly on the external environment, its unpredictability or unfairness. The test of an imaginative solution is that it can improve matters even if the external circumstances are unfavourable.

Naturally it would be desirable, probably essential, if continuity at the top were granted. No matter how

robust an institution it does require that its leadership pursue a path with constancy of purpose. Equally, it is essential that a statistical office be completely disengaged from political interference, influence and disparaging commentary both in reality and in the perception of the public. But these are matters over which only political authority has control. The best one can do is to make the strongest possible statement about the desirability of these two circumstances and how well they have served the cause of objective, impartial and reliable information in the countries in which they hold.

The texts that follow include a large number of suggestions. The majority have been tried by Statistics Canada and found to work. They promote communications, cost consciousness, foster contacts with users of data, stimulate the use of new technology, increase the motivation and the hopes of staff and generally promote a more rational use of scarce resources. They can be spelled out in far greater detail if IBGE so wishes as they are backed by detailed documentation or they can be the object of special training which Statistics Canada is ideally suited to provide. All told they are designed not so much to finish a mission as to start a dialogue the results of which may serve to help IBGE along the path of becoming a more robust and more effective institution.

A word about Statistics Canada's main mechanisms

These include Statistics Canada's planning and budgeting system (courses given); Statistics Canada's network of internal and external advisory committees (extensive documentation on mandate, rules and composition); Statistics Canada's training policy and its Training Institute (documentation available); and finally Statistics Canada's system for looking after its recently recruited human resources that must be trained and developed if they are going to reward the institution with effective and productive careers.

Some of these mechanisms can only flourish on home grounds; others are readily adaptable with little modification. Most importantly, Statistics Canada staff stand behind each and are ready to supervise their adaptation and installation.

Summary of Recommendations

The following recommendations are the results of our discussions, findings and assessment of the strengths and vulnerabilities of the situations we examined. They are listed in sequence and include recommendations affecting social surveys (section III); informatics (section IV); marketing and dissemination (section V) and training (section VI). The recommendations affecting economic statistics (section II) are the object of an expanded examination of options and are therefore not included in this summary. They should be read in their proper context - as an integral part of section II.

Some of the recommendations represent the mission's view of how similar problems would be dealt with in Canada. Others are conclusions which the staff of IBGE had already reached and which the mission wishes to confirm. In either case, however, the mission takes full responsibility for everything that it recommends which is why no author credits are mentioned.

Recommendations: Social Statistics 1996 Population Count

1. To minimize risk and ensure timely availability of the 1996 results, the assumption of a minimal 1996 Census content should be approved as soon as possible.

Processing of the 1991 Long Form Census has just commenced. If processing expectations are met, results from the latter survey should be released by mid 1995. This may leave limited time and resources for preparation for the 1996 population count. The current goal to limit content on the latter survey (probably age sex only) should be given official status in planning this initiative. In Canada it has been found useful in the Census of Population to have an official book of planning assumptions which "shape" the detailed plans for content and operations of the Census.

Annual Household Survey

2. It is recommended that the current content of the Annual Household Survey be retained so that the 1992 processing system can again be used without significant change. If content reduction is absolutely necessary, it should not be introduced in the Field until the supporting processing systems are fully developed and tested.

It is planned to reduce the content of the Annual Household Survey in 1995 (to reduce respondent burden). Given experience processing the 1992 survey, concern exists regarding how long it will take to adapt systems to this new reduced content.

Monthly Employment Survey

3. The plan to expand the survey to an additional three metropolitan areas and the Federal district should proceed as quickly as possible. The inclusion of all major municipalities should be considered as a major strategic objective by IBGE.

As a result of its timeliness and subject matter, the Monthly Employment Survey is one of the most important statistical products of IBGE. Currently it covers selected major urban areas or 27 percent of the entire population (approximately 70% of the population live in urban areas).

Family Expenditure Survey

4. Given the rapidity of family expenditure changes in the Brazilian economy, consideration should be given conducting the Family Expenditure Survey on a more frequent basis even if this implies a tradeoff and as a result current sample sizes are significantly reduced.

The Family Expenditure Survey is conducted every five years and as a result may miss rapid changes in consumer spending behaviour in response to for example, currency devaluations. This may have a measurable impact on the Consumer Price Index and therefore transfer payments.

Contention for Informatics Resources.

5. Survey programs should give explicit consideration to the affect of the scheduling of statistical projects on the capacity of informatics. (See the section on Informatics for a further discussion of this topic.)

The most immediate potential problem is the contention for computer resources that may exist in 1995 for processing the 1991 Census of Population Long Form, the Family Expenditure survey, the Census of Agriculture and the Economic Census, particularly if the latter is not greatly simplified.

Standards of Living Measurement Survey

6. A high priority should be given to negotiations with the World Bank concerning their sponsorship of a Standards of Living Measurement Survey. If it is felt desirable, Statistics Canada will assist IBGE in drafting the proposal, evaluating the World Bank offer and evaluating the "turn key" system provided to carry out the survey.

If approved, this survey will provide a timely source of needed socio-demographic data that is either not currently available or only is available from the Census of Population and Annual Household Survey on a delayed basis. The survey is also important in that it will provide an integrated source of information across a number of subject matter areas rather than comparable information from different cross-sectional samples of individuals. Since the survey interview, survey processing and survey analysis are carried out using microcomputers, this initiative, if approved, will provide IBGE with a small scale pilot to assess such end user computing solutions to survey collection.

Concern exists concerning the appropriateness of the survey content designed for and carried out in African countries for use in Brazil. This recommendation assumes that it will be possible to make appropriate

changes (as required). The first priority must be placed on this survey being a source of needed and relevant socio demographic information. Use of the survey as a demonstration of end user computing must be a decidedly secondary objective.

Recommendations: Informatics

Major vulnerabilities require IBGE wide, or beyond, changes, which will not be dealt with further in this section. Rather, we concentrate on topics for which some incremental change should be attempted.

Implement a cost accounting system.

1. This should be IBGE wide, and include all costs. However, if this cannot be done, the Informatics Directorate should implement their own, and begin making users conscious of service costs. Initially, the "invoices" should be handed to users by senior DI officers and the contents explained and discussed. Any indicated actions must be negotiated and this requires a mechanism, e.g. formal weekly meetings.
2. Following recommendation #1, introduce measures to reward cost saving behaviour such as overnight use of the mainframe. This will help to provide mainframe availability for participation in Client/Server developments. See also point 7 below.

Training

3. Develop, in collaboration with the Institute, a systematic training program for informatics professionals. This is useful both to enhance skills, and as a motivator. It will enhance the ability to absorb newer techniques depending on the pedagogical choices made.

Significant IBGE wide benefits are available from adoption of some modern technologies (see point 7 below), and their ability to deliver benefits will depend directly on the ability of staff to implement and support those technologies.

Co-location

4. Propose to several users a co-location of their DEATE teams. This should include both development and support projects. The proposal should follow negotiations with the users regarding the objectives to be attained by co-location, and periodic follow-up to agree on progress towards the agreed objectives. Clearly one pervasive objective will be to foster a spirit of shared goals and mutual responsibility for results.

Client Relations

5. Appoint a senior DI officer to be responsible for relations between DI and each of its clients. This could be someone from DEATE, or a separate group, but must cover ALL services of the Directorate. The most important task of this officer will be to identify the need for project management standards and to use all efforts to engineer a proper project management structure for all developmental projects.

Project Management

6. DI should convert to project management standards, commencing with a formal definition for all current and future projects. This will result in an improved appreciation of the impact of all new projects, and a clarification or confirmation of all current projects. Minimum deliverables from the definition phase of a project (see the booklet supplied on Project management) are:

- i) description of the purpose of proposed system;
- ii) initial estimate of costs, time and resources required; and
- iii) record of approval to proceed.

Client / Server Computing

7. Begin a program of Client/Server(C/S) computing development, based upon international network standards, as rapidly as budgets permit.

This should not be a radical "dump the mainframe, shoot in the opposite direction" move but rather a systematic search for cost-effective applications for C/S implementation. The mainframe should remain the site for data warehousing, for most major survey "back-end" processing, and should be targeted as the responsible center for network wide system security.

New systems, using operating systems such as UNIX, and desktop systems, using UNIX, Windows and NT, can provide high productivity for interactive processes such as data analysis, Computer Assisted Software Engineering (CASE), and personal computing applications. This direction of computing, at Statistics Canada, as at many other organisations, has had the effect of fostering computer literacy across the agency, expanding the use of purchased software, and greatly increasing the range of technical choices for each application. The System Development Division has become more adept at system integration i.e. the assembly of a system, which, though entirely individual in its final configuration, includes components which are purchased, constructed in house, or reused from other systems.

The proposed installation should start by being intra-site, in order to avoid the vagaries of the telecommunications services, but with provision for inter-site communications. Mangueira should be a first site; it is essential that the mainframe be from the beginning, a vital part of the Client/Server environment at IBGE.

8. Begin negotiation with selected clients at Mangueira for potential Client/ Server system installation. These negotiations should include:

applications (or components thereof) to be installed, and relationship to current mainframe systems;

conduct definition phase of conversion/installation project; and

a definition of responsibilities between DI and Client.

Mainframe Cost

9. Review all costs of providing the mainframe service. This should include identifying staff who are surplus to the direct tasks of running the service; evaluating purchase rather than rental for equipment; and estimating a saving from competitive procurement practices.

Recommendations: Dissemination Planning Data Base

1. The new publications planning data base should be fully developed and made operational. Under the lead of CDDI an annual publications plan should be established and negotiated with the "Diretoria de Pesquisas". Changes in the plan and shifts in priorities should also be negotiated between the two organisations.

2. The publications planning data base should also be the operations monitoring data base in which completion dates and other actual information (if different from the planning figures) are added.

Micro Computers 3. As resources permit, newer micro computers should be added to the publishing operations.

Cost Accounting

4. Cost accounting should be introduced such that costs for each publication are recorded. These costs

consist of indirect and direct costs broken down by salary and non-salary items. Some of the costs can be measured directly, others need to be allocated according to formulae. Cost recording allows a review of the performance of individual publications (costs and revenues) and is the basis for decisions on reductions of costs globally.

5. CDDI should develop statements of cost and revenue performance for individual publications and make them available to authors.

Publications

6. Bookstores should have the choice between two types of discounts. A lower discount if they can return unsold publications to CDDI, a higher one if they buy publications from CDDI and pay up front.

7. Time should be taken to find out why the existing sales of publications are so low. Such product evaluation and market research should be done in cooperation with the "Diretoria de Pesquisa".

8. IBGE should define a policy on publications and set targets for annual revenue-cost performance for the total publishing program. Such a policy would define what constitutes public good (free access by citizens) and what is the goal of revenue generation (e.g. revenues from all publications must cover the post manuscript production costs).

9. Xerox publications should have a consistent approach for their cover pages and reference to IBGE as the originating organization. Prices should be increased.

SIDRA

10. SIDRA should be declared a strategic product and be resourced adequately for its development and operation. Particular attention needs to be paid to updating of the data (correct data, timeliness) and access facilities to the data base (speed of response).

11. A dissemination strategy should be developed which ensures that other information services (inside and outside IBGE) do not undercut the potential revenues from SIDRA.

12. It should be investigated whether private information companies are interested in carrying information from SIDRA under contract with IBGE. These companies are very effective distribution channels. They have the infrastructure (hardware, software, network, support) and can market effectively additional information sets. (Statistics Canada's CANSIM time series data base is offered by 7 companies, e.g. Reuters, DRI).

Special Tabulations

13. Special tabulation request services should be reintroduced in cooperation between CDDI, "Diretoria de Pesquisas", and "Diretoria de Informatica". A corporate cost recovery policy and mechanism needs to be defined.

Recommendations: Training

The current situation at IBGE is that there are limited professional and technical staff, no new hiring and a decreasing budget. Since management cannot change externally imposed restrictions it must aim at providing other incentives to its staff. These might include a more varied career, better practical training even if such training may entail higher wages or the loss of a well trained employee to the private sector. It is essential however that steps be taken. The alternative is that staff will sit idly by as the agency loses resources year after year and its workload commitments increase.

Training must be viewed as a major strategic direction to be taken to:

manage financial and human resources more efficiently;

improve staff productivity;

increase versatility of staff to allow them to be used where they are needed and to make more informed decisions; and

provide the opportunity for employees from different parts of the Institute to come together in a training mode to exchange ideas and experiences.

The recommendations that follow are based on some very practical steps taken at Statistics Canada, starting about 5 years ago, to deal with many of the same types of issues. Experience has shown that they have been successful. A certain degree of patience is required at the beginning until things begin to work. It is important that there be early successes in order to gain the momentum and reduce the feeling that nothing can be done. IBGE should in the short term (in the next year) initiate the following activities.

Management Organization

1. Prepare and communicate a statement of intention in relation to training at IBGE.
2. Identify a senior survey manager and give this person the responsibility of determining the practical training needed. This person is the 'Product Champion
3. Establish a Training Committee that reports quarterly to the President on progress and plans. The membership is important as is the amount of authority to act.

Members could be as follows: Chaired by the Director of Surveys with senior members from ENCE, Human Resources, a Regional Office, Coordination and Dissemination, and Informatics, the senior manager identified as 'Product Champion and others as required such as representatives from the various Directorates. It is important that these representatives be line managers and not entirely people from the planning offices. Employees from the non survey areas are there to support and implement the decisions of the committee

The mandate includes:

- allocation of training resources;
- establish training priorities;
- coordinate and integrate training activities;
- establish a set of guidelines to clarify training objectives;
- develop an overall plan outlining the knowledge and skill requirements for each major type of job; and
- implement the philosophy that all professionals are a teaching resource to be utilized by the corporation in delivering practical training to as many staff as possible.

Implementing these will put in the management structure necessary to strengthen decision making, and ensure that line managements needs are being taken into consideration when priorities are being established and courses are being designed.

Introduction of Practical Training

4. Start to balance the curriculum by developing a Survey Skills course similar to the 6 week course at Statistics Canada. This should be developed and delivered by a team of 4 survey people working with staff from ENCE to ensure relevance and commitment This is a big step that will start to the thinking along practical training lines and if implemented within 6 months will sent the correct message to staff and other managers. At the same time, as a matter of priority, short introductory courses in survey methods,

questionnaire design and sampling as examples should be designed with the survey people for their staff. This will help during the survey design activities (these do not have to be sophisticated but must be useful). See Annex VI for costs associated with this recommendations.

5. Develop in collaboration with Statistics Canada a Project Management course specifically tailored for IBGE staff at all levels.

6. IBGE should send representative(s) to Statistics Canada to investigate internal and external communications policy and mechanisms including media relations, decision making processes including management and advisory committee structures and finally the corporate planning process. As well as the operation of the STC Corporate Assignments program that has been highly successful in systematically reassigning staff to diversify their skills and develop their capabilities

7. In the longer term IBGE should consider practical training to the people who can benefit the most at first but eventually a little to a wide range of people in these areas:

- survey skills for juniors;
- computer software training for people as they get new equipment; and
- marketing for those involved.

Associated Initiatives

8. The Training Committee should explore the benefit of a formal assignment program similar to the Corporate Assignment Program at Statistics Canada. This type of program stimulates mobility, increases the skill and knowledge of staff, provides flexibility to move resources where they are most needed and provides variety and incentive to staff.

SECTION II - Economic Statistics Program Issues

Recognising the need to increase the efficiency of collection and timeliness of release of results in the face of continuously declining resources, a review of the economic statistics program was started by the Institute in 1992.

The findings summarised below benefitted greatly from the assistance of the staff of IBGE in explaining the results of their review and providing the attached report (See Annex).

Findings

The economic statistics program is composed of a five yearly Economic Census and a program of Annual and Monthly Surveys.

Economic Census. The last Economic Census was conducted in 1986. It collected data for reference year 1985, providing results for small enterprises in 1989 and for all enterprises in 1991. Though the Government provided resources to plan the next Census, no resources were provided to conduct the Census in 1991.

In 1992, the Institute began a comprehensive reexamination of its program of economic statistics which involved a new approach to the taking of the next Census. Resources were provided in 1994 to start planning the Census to be taken in 1995. The Institute awaits a budget allocation of resources to undertake a Census in 1995 and to decide upon its program for that and subsequent years.

Business Register. The quality of an economic statistics program depends on the completeness and quality of a register of businesses to be surveyed. The first efforts to create a Register go back to the 1970's. However, the development of a Register became an effective possibility only in 1985, with the adoption of

the single identifier of the Income Tax Authorities for enterprises in the Economic Census. In 1985, a list of 1.1 million enterprises of respondents to the Economic Census was created, which identifies a hierarchical structure of enterprises and local units.

Annual Surveys. The Annual Surveys provide intercensal data. Those conducted after 1985 developed their own separate frames derived from the list of enterprises, supplemented by information from administrative registers to capture the births of new businesses.

Though the Annual Survey of Manufactures was restructured in 1985, the design of the forms remained very complex making fine distinctions which tried to capture "technical activities" or processes to implement the concept of the establishment. The samples remained large. Further the lack of timely Census information and the misclassification of units on the administrative registers has contributed to a deterioration of the survey samples. A scarcity of resources and outdated systems have contributed to delays in releasing data from these sample surveys (see following table).

ECONOMIC SURVEYS / Situation as of July 1994			
Continuous Surveys	Reference Year	Year of Collection	Availability to the User *
Annual Industrial Survey	1986	----->	Leading Enterprises 86/87/89 - July 1994 Enterprises 86/87 -Foreseen for Oct. 1994 Enterprises and Activities 88 - Foreseen for Oct. 1994
	1987	1989/90	Leading Enterprises 89/90 - Foreseen for Oct. 1994
	1988	----->	Enterprise Activities 89/90 - Foreseen for Feb. 1995
	1989	1990----->	-----
	1990	1991----->	Leading Enterprises 1992 - Foreseen for Dec. 1994
	1991	No Survey	Enterprises and Activities 1992 - Foreseen for Dec. 1994
	1992	1993	Leading Enterprises 1993 - Foreseen for Dec. 1995
	1993	1994	Enterprises and Activities 1993 - Foreseen for Dec. 1995
Annual Survey of Construction	1990	1991	Published in Nov. 1993
	1991/92	1993	Foreseen for Sept. 1994
	1993	1994	Foreseen for Sept. 1995
Annual Survey of Trade	1990	1991	Foreseen for Aug. 1994
	1991	No Survey	-----

	1992	1993	Foreseen for Dec. 1994
	1993	1994	Foreseen for Dec. 1995
Annual Survey of Road Transport	1990	1991	Published in 1993
	1991/92	1993	Foreseen for Dec. 1994
	1993	1994	Foreseen for Dec. 1995
* "Foreseen" refers to the dates on which the manuscripts are sent for printing to the Publications Unit.			

Classification. A classification of economic activities revised for each Economic Census is used for classifying economic data produced by the Institute. As the classification was primarily designed for the scope of the Census, other agencies such as Inland Revenue, Social Insurance, and Manpower, modified the Classification and introduced more detail for their own use. Accordingly there is no standard classification. Further, as the classification was developed giving more weight to domestic concerns than to international comparability, there is limited compliance to international standards.

(See the annex for a more complete description of the current situation with respect to economic surveys.)

Review of the Statistical Program

The review of the economic statistics program which was started within the Institute in 1992, has identified the need for a new approach to the collection of economic statistics involving:

- the creation of a common Business Register for the Economic Census and all the Annual and Monthly Surveys, based on a list of respondents to the Economic Census and updated by information from administrative registers;
- the adoption of a new comprehensive Classification of economic activities in the Register, to more adequately reflect the current structure of the domestic economy and the analytical requirements of users, as well as, to allow international comparability of economic statistics and its standardized use in administrative records;
- simplification of the statistical units used in the Annual Survey of Manufacturing;
- simplification of the questionnaires of the Annual Surveys for Manufacturing, Trade and Transportation;
- reduction in the size of the samples and panels used for the Annual Surveys;
- standardization and integration of concepts;
- modernization and standardization of systems used in the collection and processing of data as well as development of the automated system used for coding units to the classification; and
- better presentation of data output to users.

Developments and Outstanding Issues

Business Register . In 1994 a database system has finally been completed to create a Register in which the file of enterprises and local units identified by the 1985 Census and the units of the administrative files will be merged.

However, the creation of the Register requires:

- the identification of non-operating units (deaths);
- the correction and confirmation of the classification of units and the coding of the units to the new classification so that the Register can serve as a sampling frame for the annual and monthly

- surveys. (A comparison between the classification of the local units of the 1985 Census and the administrative files shows a misclassification of 50 % of the local units in manufacturing in the administrative files);
- the extension of the current automated and computer assisted coding system; and
 - formal arrangements with Ministries to systematically receive updated administrative files from them.

New Classification of Economic Activities. A new classification is under development based on the Standard Industrial Classification of all economic activities of the United Nations (ISIC Rev 3.) which will now have a comprehensive classification for all economic activities not just those in scope in the Census. The three and four digit structure of ISIC Rev 3 has been expanded to reflect domestic requirements. This has been done in consultation with other Government Departments and Agencies including the Central Bank, with Business and Trade Associations and with the Agencies responsible for maintaining administrative registers. For instance the 159 three digit classes of ISIC have been expanded to approximately 213 classes, and the 292 four digit classes of ISIC have been expanded to approximately 560 classes.

The new Classification is expected to be ready by November 1994 for implementation in January 1995. However, for implementation in the Business Register, certain supporting documents need to be produced:

- a concordance between the old and the new classification;
- a revised list of products coded to the new classification; and
- a list of activities coded to the new classification.

Simplification of Statistical Units. The need to adopt a new approach for delineating establishments in Manufacturing has been recognised.

Instead of identifying numerous "technical activities" or processes, the new units will need to be defined with reference to the production of marketed products homogeneous in terms of the four digit classes of the new classification.

Simplification of Questionnaires and Samples. With the aim of increasing the efficiency of data collection and timeliness of release of results, a methodological review of the annual surveys was undertaken and a number of steps have been taken to simplify questionnaires and samples.

Annual Survey of Manufactures. The number of variables were reduced and the number of forms sent to large and medium businesses was reduced from four to two, with a supplement for complex enterprises. Small enterprises were completely eliminated from the survey. These actions led to a reduction of the number of forms from 48 thousand to 25 thousand for the surveys taken in 1993 and 1994.

Annual Survey of Trade. Instead of sending three different forms to businesses of different sizes, the number of forms was reduced to one. By 1992 deaths had reduced the sample from 60 thousand to 48 thousand enterprises. This sample was further reduced to 18 thousand by eliminating small enterprises for the surveys taken in 1993 and 1994.

Annual Survey of Road Transport. What was earlier a census was changed to a survey of a panel of the largest enterprises covering about 90 % of the activity, resulting in a reduction of enterprises from 24 thousand to 8 thousand. This survey went to the field in October 1993 to collect data for 1991 and 1992.

Annual Survey of Construction. This new survey started in 1991 did not need to be changed

Modernization of Systems. The improvements described above were done without any changes to current systems. These now need to be reviewed and the existing automated system for coding manufacturing units with product information needs to be extended for coding the activities of the non-goods producing sectors of the economy.

Economic Census: New Approach

The approach to the 1985 Census had been to send a long and exhaustive questionnaire to some 1.3 million enterprises, which did not include certain sectors of the economy, such as Financial Services, Telecommunications, Utilities, Education, Health and nonprofit organizations.

The approach being considered by the Planning Group, is more comprehensive in terms of coverage, than that of the 1985 Census. For the estimated universe of 3 million enterprises, the aim is to accomplish a variety of goals with the help of a simplified questionnaire for all but the very largest 4,000 manufacturing enterprises, who would be sent the longer questionnaire of the annual survey.

The goals of this Census include:

- the collection of all items of information provided for in the data base of the Business Register;
- the collection of the main economic variables, employment, revenues, and wages as well as the basic variables required to calculate value added, for the whole universe; and
- the collection of activity descriptions for the classification of all units to the new classification, supplemented by the collection of quantities and revenues for the main product outputs and description of principal inputs of local units.

This last requirement was:

- to precisely classify manufacturing units to the four digit level of the classification with the help of product information; and
- to allow the selection of samples based on product information for the monthly commodity survey.

New Approach: Systems and Procedural Requirements

For the classification of units on the Business Register, requirements include:

- the extension of the present system of automated coding of products for Annual Survey of Manufactures, to the automated coding of activities for all other sectors of the economy;
- pilot testing of the new simplified questionnaire; and
- the design of new data capture, editing and processing systems for the new simplified questionnaire.

New Approach : Characteristics

So far the new approach has been designed to serve three main purposes:

- collect a minimum set of variables to provide economic data for the whole economy;
- adopt the new classification; and
- update the Register for multiple purposes.

This approach has been designed in uncertainty about the ultimate allocation of the budget. Even though it would be modified in the light of that information, when it becomes available, it is useful to review the characteristics of the approach as presently formulated which include:

- an expansion of the coverage of the Census to all sectors of the economy and an estimated 3 million enterprises as compared to 1.3 million enterprises in the 1985 Census which covered only manufacturing, trade, transportation, services and construction;

- the introduction of one simplified form in place of seven different kinds of long and complex ones;
- a complete update of the Business Register with information from the Census to provide a frame for the annual and monthly surveys, and to allow for the eventual dissemination of the data on the Register including the main economic variables of revenues, wages and employment for the whole economy, classified by four digit industries of the new classification and by geographical area down to the municipality;
- the ability to calculate value added (GDP) for the whole economy, by four digit industries of the new classification and by geographical area down to the municipality;
- an indication of products produced and used for all goods producing establishments, to serve as a frame for drawing samples for the monthly product survey; and
- an expected reduction in per unit collection and processing time due to the simplification of the questionnaire.

Vulnerabilities of the New Approach

Several vulnerabilities to this approach can be seen:

- not much improvement in timeliness;
- the comprehensive Census approach to the whole universe involves surveying almost twice as many units as in 1985;
- due to the multiplicity of goals to be achieved, the questionnaire remains sufficiently complex for collection, data entry, editing, processing and analysis to require more than one year for completion;
- though the new questionnaire has been designed, pilot testing remains to be done;
- the new questionnaire requires the design of new data capture, editing and processing systems;
- though an automated coding system exists for coding the products of manufacturing establishments to the old classification, it has to be converted to the new classification and expanded for coding units in other sectors.

Given the reduction in professional staff that has occurred in all areas over the last few years, there is a danger that the release of the results of the Census will not take place within an acceptable time frame. The combination of the size of the universe to be covered, the complexity of the questionnaire, in terms of the number and type of variables to be collected, and the need for new systems increases the number of uncertainties, which will likely result in a long delay in producing the results of the Census.

Despite these risks if sufficient resources are provided a Census as designed can be undertaken.

However, if no additional resources are provided or insufficient resources to conduct a census are provided, an alternative approach to meet some of the perceived needs of the economic statistics program is recommended.

Alternative Option .

The goals of the program for 1995 should be revised. The timely production of some economic data should become the principal goal of the program. The program for 1995 should consist of two parts. The Annual Surveys and a Survey to update the Register.

Annual Surveys.

1 The 1994 Annual Survey program should be repeated in 1995 with the customary updating of the sample frame with information on births from the administrative files and such minor modifications and improvements as are feasible and considered absolutely necessary.

2. The results of the Annual Surveys should be released as soon as possible, classified to the current classification.
3. As a second step, those units covered by the Annual surveys which do not need to be redesigned should be reclassified to the new Classification, and the results provided to the Business Register. This will contribute to the achievement of the goal of reclassifying the Register to the new Classification.
4. The question of when and how to redesign the establishments of the Survey of Manufactures that need to be simplified will have to be addressed either before or after the 1996 Survey depending upon the methodology to be followed for the 1996 survey.

Register Survey

5. A Survey should be carried out to provide the Register with some but not all of its information requirements for all those enterprises and their local units above a certain cut off, that have not been covered and reclassified by the Annual Surveys and a sample of smaller enterprises.
6. The proposed questionnaire should be simplified even further to collect only a very limited number of necessary items of information. The aim of the questionnaire should be to collect only one economic variable - employment - and enough information to be able to directly code the unit to the three digit level of the new Classification. Other information relating to the main products produced or activities undertaken will permit classification of the unit to the four digit level of the new Classification to the extent possible. The items to be deleted from the questionnaire as presently designed, are indicated on the attached copy of the questionnaire(see Annex).
7. For those manufacturing units that produce more than one product, follow up may be required to determine the value and volume of their products to help in more precisely coding units to the four digit level of the new Classification.
8. The coverage of the Register Survey should be restricted to:

all enterprises and their local units above a certain revenue and /or number of employees cut off, that have not already been covered by the Annual Surveys; and

a sample of units below the cut off, which could be somewhere between 1 to 3 percent of the set of units below the cutoff.

9. The information relating to the surveyed units should be processed as soon as possible and estimates of employment by industry, for 1994 based on the new Classification, should be released as soon, after the end of 1995, as possible.
10. With respect to the goal of the Census to provide the Annual Economic Surveys and the Monthly Product Survey with sampling frames at the four digit level of the new classification, it is recommended that for the smaller units below the cut off, the samples should be chosen from the units sampled for the 1995 Register Survey.

Sampling Methodology.

11. The samples for the annual and monthly surveys will not be based on a universe frame but will draw on units covered by the initial sample selected for updating.

Characteristics of Alternative Option

Lower risk in that it will require very little change to current systems and procedures already in place. but

Higher risk in terms of depending upon sampling methodology for the annual and monthly survey program.

Timely data comparable to 1993. There will be a much greater possibility of producing timely economic statistics for 1994. They will be comparable to 1993 as they will be on the same classification.

Lower respondent burden. The use of a very simple form for updating the Register will require little effort on the part of respondents resulting in faster turnaround at the collection and processing stages.

Lower cost. A reduction in the total number of enterprises and units covered will make the whole project more manageable at a considerably reduced cost.

Steady Annual Costs. The Business Register will not be comprehensively updated in one year. Updating will become a gradual process to be carried out over a number of years.

Need for annual resource allocation.

In any event, resources will have to be provided for the maintenance of the Register on a continuing basis, as part of the Annual program. For example, deaths of businesses will be identified by the Regional Offices on a continuous basis and births will have to be coded on a continuous basis from the administrative files for which an annual Register Survey will have to be taken.

Technical Assistance from Statistics Canada.

For the new 1995 Register Survey, Statistics Canada will provide technical consultation and advice in four main areas.

1. Statistical Methodology. Advice with respect to sampling procedures for the Annual Survey of Manufacturing and the Monthly Product Survey. if the optional approach is adopted.
2. Operating Systems. Advice with respect to the modernization of operating systems for data capture, editing and processing of data.
3. Business Register. Advice on the design of the maintenance of the Register.
4. Classification and Profiling. Advice with respect to the manner in which new units should be delineated and information to classify units should be collected on the questionnaires.

SECTION III - Social Statistics

Program Issues

Findings

It is clear that the staff of the Surveys Directorate and those working in association with them care greatly for the quality and precision of the statistical products that they provide. Although strikes and budgetary uncertainty have taken their toll in reducing their capacity to bring forward statistical products, their enthusiasm for statistical challenge is clear. Their frank assessment of the challenges they face was appreciated even though, in many cases, solutions to the problems were either beyond their control or were not apparent.

Strengths

In surveys such as the 1991 Census, significant efforts have been made to make the survey as relevant as possible by consulting with external users to determine their content needs.

Technology has been introduced in a number of surveys to improve timeliness and quality. Examples

include the use of automated coding to code religion, country of birth, previous residence, education attainment, occupation and labour force activity on the 1991 Census (with a 90% successful hit rate) and the introduction of UNIX technology for data capture and preliminary processing of survey data in the State Offices.

Generally, the methodologies employed to collect information from Brazilian households is comparable to that used in Canada with extensive use being made of area based samples. Although the telephone is used in some surveys such as the monthly employment survey (PME) for interviews subsequent to the first, most interviews are conducted in person. (Lack of telephones, especially in remote parts of the country, are the significant limiting factor in the application of this methodology.)

Coverage of household surveys is generally national with the monthly employment survey being a notable exception.⁽¹⁾ Plans, if funded, call for extension of the survey to three other metropolitan areas and the Federal District.

Since the late 1980's the State Offices have been given increasing responsibility with respect to the data capture and editing of household surveys. This decentralization of responsibility has worked well for surveys including the 1991 National Census.

Negotiations are currently underway with the World Bank concerning their sponsorship of a national Standards of Living Measurement survey. Although such a survey will not be able to provide detailed information on small geographic areas within Brazil, it will provide a valuable and timely additional source of information (especially given delays in other data sources) on the social conditions in the country.

Vulnerabilities

Coverage of Establishment Employment Survey. The survey uses the 1980 Census as a frame and it has not been updated since its original creation. Concern exists that the estimates no longer cover adequately the economic sectors which have expanded in Brazil since 1980 (e.g., services, electronics, cars). Existing data support the hypothesis of generally significant productivity gains. These estimates may be biased downward - if data for the newer expanding sectors were available, greater productivity gains might be evident.

Dependent on the time by which the 1995 Economic Census is completed, the Establishment Employment Survey may continue with its 1980 frame into the 21st century.

Timeliness. In most respects, the utility of statistical information for policy and program development is as much a function of its timeliness as its quality. Although many surveys examined do have relatively short durations from the end of the reference period to the release of information ⁽²⁾, some important exceptions do exist.

Annual Household Survey (PNAD). The annual Household Survey is the major source of a wide range of data on the socio-demographic status of the Brazilian population. Unfortunately, information from the 1992 survey has yet to be released.

For the reference year 1992, major content modifications were introduced to the survey. However, delays in processing the 1992 survey resulted from problems with the new edit specification and programming. It is expected that this survey will be released in the spring of 1995.

The 1993 survey was conducted but results have yet to be processed. As the 1993 survey is the same as the 1992 survey, it is expected that this survey can be processed and released three months after the 1992 data.

The 1994 survey was not conducted as the 1992 and 1993 surveys have not yet been processed and released.

1991 Census Long Form. Results from the 1991 Census short form results were released in the summer of

1994. However, headquarters processing of the Census Long Form has just begun. Edits have been largely specified but concern exists about the complexity of a edit and imputation system brought from Spain (based on Fellegi and Holt) as applied to documents as complex as the Census long form. More should be known concerning problems at the end of a test of the system during the week of September 5th. In the future the use of complex, systems upon which deadlines are dependent but which have not been tested should be avoided.

IBGE staff hope that the processing of long form results will be completed by mid 1995. As well as being important from a timeliness perspective, such a completion date will probably be essential to avoid competition for informatics resources resulting from the processing of the 1995 Economic Census and the Census of Agriculture.

Extensiveness of Data Processing. Many of the household surveys carried out by the programs are both lengthy and complex. Examples of this include both the 1992 and 1993 version of the Annual Household Survey and the 1991 Census Long Form. Complexity and length of these surveys have caused substantial problems for the timely completion and release of results. Complexity and length are not solely a reflection of the subject matter interests of the survey designers, but are also a function of the expressed needs of external users. However meeting these needs has had, arguably, too high a price.

The extent to which IBGE should "clean" data sets through editing and imputation is a matter of substantial internal debate. On the one hand, IBGE has greater internal capability to make such corrections than data users, while on the other hand the time necessary to make such corrections is substantial and can meet with resistance in the academic community who desire access to data sets spared of imputations and associated prior assumptions.

Servicing Remote Areas. As in Canada, Brazil has a particular challenge in collecting and disseminating information in its remote regions. In terms of collection remote areas pose problems in hiring and retention of qualified interviewers and the need for "distance education". With respect to data access in remote areas greater responsiveness is required in meeting the needs of rural municipalities for data. Even when the information is available, it can take substantial time to access it. It was noted that it can take at least three months to fulfil the some requests for information.

Remoteness from the Dissemination Process. Program personnel feel relatively remote from the dissemination process. Textual and tabular material and data files are prepared and forwarded to the Dissemination Directorate and (although somewhat of an overstatement) "never to be seen again". This institutional discontinuity has the adverse affect of distancing analysts and those preparing publications from their users unlike the more satisfactory links which seem to exist during the survey design process. It also may have the effect of acting as a barrier to clients receiving the detailed advice that they may require with respect of survey design and content. ⁽³⁾

Recommendations

1. To minimize risk and ensure timely availability of the 1996 results), the assumption of a minimal 1996 Census content should be approved as soon as possible.

Processing of the 1991 Long Form Census has just commenced. If processing expectations are met, results from the latter survey should be released by mid 1995. This may leave limited time and resources for preparation for the 1996 population count. The current goal to limit content on the latter survey (probably age sex only) should be given official status in planning this initiative. In Canada it has been found useful in the Census of Population to have an official book of planning assumptions which "shape" the detailed plans for content and operations of the Census.

2. It is recommended that the current content of the Annual Household Survey be retained so that the 1992 processing system can again be used without significant change. If content reduction is absolutely necessary, it should not be introduced in the Field until the supporting processing systems are fully developed and tested.

It is planned to reduce the content of the Annual Household Survey in 1995 (to reduce respondent burden). Given experience processing the 1992 survey, concern exists regarding how long it will take to adapt systems to this new reduced content.

3. The plan to expand the survey to an additional three metropolitan areas and the Federal district should proceed as quickly as possible. The inclusion of all major municipalities should be considered as a major strategic objective by IBGE.

As a result of its timeliness and subject matter, the Monthly Employment Survey is one of the most important statistical products of IBGE. Currently it covers selected major urban areas or 27 percent of the entire population (approximately 70% of the population live in urban areas).

4. Given the rapidity of family expenditure changes in the Brazilian economy, consideration should be given conducting the Family Expenditure Survey on a more frequent basis even if this implies a tradeoff and as a result current sample sizes are significantly reduced.

The Family Expenditure Survey is conducted every five years and as a result may miss rapid changes in consumer spending behaviour in response to for example, currency devaluations. This may have a measurable impact on the Consumer Price Index and therefore transfer payments.

5. Survey programs should give explicit consideration to the affect of the scheduling of statistical projects on the capacity of informatics. (See the section on Informatics for a further discussion of this topic.)

The most immediate potential problem is the contention for computer resources that may exist in 1995 for processing the 1991 Census of Population Long Form, the Family Expenditure survey, the Census of Agriculture and the Economic Census, particularly if the latter is not greatly simplified..

6. A high priority should be given to negotiations with the World Bank concerning their sponsorship of a Standards of Living Measurement Survey. If it is felt desirable, Statistics Canada will assist IBGE in drafting the proposal, evaluating the World Bank offer and evaluating the "turn key" system provided to carry out the survey.

If approved, this survey will provide a timely source of needed socio-demographic data that is either not currently available or only is available from the Census of Population and Annual Household Survey on a delayed basis. The survey is also important in that it will provide an integrated source of information across a number of subject matter areas rather than comparable information from different cross-sectional samples of individuals. Since the survey interview, survey processing and survey analysis are carried out using microcomputers, this initiative, if approved, will provide IBGE with a small scale pilot to assess such end user computing solutions to survey collection.

Concern exists concerning the appropriateness of the survey content designed for and carried out in African countries for use in Brazil. This recommendation assumes that it will be possible to make appropriate changes (as required). The first priority must be placed on this survey being a source of needed and relevant socio demographic information. Use of the survey as a demonstration of end user computing must be a decidedly secondary objective.

Technical Assistance from Statistics Canada

The weighting of the Monthly Employment Survey is carried out using a "black box"⁽⁴⁾ program of early 1980 vintage written in COBOL. Although the program works, concern exists that no documentation or expertise exists in the workings of the program. Given the importance of results from this survey, it is important that operational risk be reduced through replacement of this application at the first possible opportunity.

Statistics Canada has spent significant resources in the recent past on generalized survey processing

programs. The aim of these applications is to reduce the cost of survey development and ongoing system maintenance. (See the section on Informatics for a discussion of Statistics Canada Generalized Systems.)

Statistics Canada would be pleased to work with IBGE on the implementation of a Generalized Estimation System to replace the current "black box" COBOL application in the Monthly Employment System

SECTION IV - Informatics

Program Issues

Findings.

Interviews were held with all senior management of the Informatics Directorate (DI), including the Director and all first line officers. The adjoint Director was present at all interviews, and my contact from head office, who was present most of the time, also acted as a translator. At most interviews several of the second line officers were also present. This was encouraging as it showed a non-bureaucratic side of IBGE. Some animated discussions indicated a higher level of interest, at least on the part of those people with whom I met, than expected.

IBGE's informatics Directorate is mainframe oriented. With the exception of the state office systems, little use is made of other types of computing system. The state office systems use UNIX as an operating system, and CPU's based on the Motorola 68040(RISC) chip. But their system development methods tend to be traditional, using procedural code, and a dated, procedural methodology. Little progress was noted in incorporating more modern approaches. In particular, notwithstanding a shortage of DEATE resources, little use is made of general software to obviate custom development.

At Statistics Canada considerable effort has been made, and continues to be made, to identify ways of avoiding custom development, which is both expensive and risky. We have developed a suite of general software, details of which appear in the appendix, and resort to commercially available software that obviates or reduces the need for custom development. The results are more robust systems, since much of the software has been debugged by prior use by others. Software of this type is more readily available for smaller systems, PC's and UNIX workstations.

In general, DI staff productivity could be enhanced with access to such systems. Our experience shows that difficulty in defining precisely when a project is completed results in an high opportunity costs of resources that tied down to projects for longer periods than necessary. However, the reluctance to change approach at IBGE seems to be a particular manifestation of a general reluctance to take decisions. The overall result is a bottleneck of computer system development work which, quite possibly, influences users' reluctance to accept completion of a project.

System development work requires an atmosphere of willingness to take decisions both by the developers and the users. This type of managerial freedom is not in much evidence in the development activity at IBGE. It will require time, and the patience to accept some wrong decisions, before the general climate can be improved.

Notwithstanding the reported poor level of staff morale, there are bright and motivated people in DI who keep abreast of developments in the field, have good ideas, and who have produced innovative software. The system to maintain meta and micro data bases (retrieval of micro data uses the Statistics Canada RAPID system acquired in the early 1980's) of survey results, and the operational process of constructing them from survey operational files, is a good example of effective use of informatics technology. However, more in evidence is an inward focus developed as a consequence of the prevailing climate.

The challenge is to identify changes, both IBGE wide, and within DI, that will improve this climate. Until it is, the low morale on the part of some DI staff, and doubts about their performance in the eyes of users, have the result that the Informatics Directorate is contributing less to IBGE than it is capable of. An analyst

retained on a project when it could be managed by the user is not available for a new assignment, however pressing the need; computer scientists writing code for several months when a solution could have been purchased for a few hundred dollars represent lost opportunities. An organisation with budget problems can ill afford to under-utilise its valuable and scarce resources.

Strengths

Senior Informatics staff's good level of ability provides the nucleus of a good team and an ability to learn, to keep abreast of developments in informatics technology (IT), and a willingness to use help in identifying improvements. A modern mainframe, supported by a competent technical staff, which, with better load balancing, could be used to supply additional services. Notwithstanding reports from HQ and some survey areas of a less than desirable level of credibility, DI has nevertheless shown the ability to produce worthwhile and innovative uses of Informatics technology. The development of the meta and micro databases which now form the operational and support role of the DEBAD section are worthy of particular note in this respect.

Vulnerabilities

- (1) The reported low state of morale of systems professionals, from the poor physical environment of the Mangureira site, and lack of a relevant reward system. The result is that it is difficult to retain the best staff, and, given a freeze on hiring, impossible to replace losses;
- (2) the low level of use of client/server technology (C/S) and absence of local area network (LAN) facilities leads to isolation of the mainframe, and less support to programs from IT than is both possible and desirable. This increases the danger of obsolescence on the part of DI, and if uncorrected, could lead to increasing irrelevance and a reduction of the directorate's contribution to IBGE;
- (3) inadequate use of commodity software and end user tools for data processing and analysis. This exacerbates the shortage of high calibre systems professionals, and consequent development bottleneck;
- (4) not independently of point #1, an uncomfortably high tolerance for the structural rigidity affecting staffing and budgets, and a consequent lack of readiness to take decisions, as for example, to work with the Institute to look for training opportunities as a motivational tool; to develop a strategy of investment in experimentation in more modern IT tools;
- (5) isolation of systems work from collaborating disciplines, including end users, implying undue difficulty in developing shared commitment to successful results;
- (6) the absence of cost measurement, indeed of cost consciousness, which results in an absence of quantification, and therefore, no sound basis for choosing between alternative courses of action; and
- (7) as a special case of the above, the IBGE mainframe installation costs more than double the cost of the Statistics Canada installation for a comparable computer. We have long abandoned reliance on a single supplier as being unnecessarily costly, and judicious planning of capital purchases over a horizon of several years, as an alternative to lease or rental, has proved to be a more cost effective means of computer power acquisition.

Recommendations

Major vulnerabilities require IBGE wide, or beyond, changes, which will not be dealt with further in this section. Rather, we concentrate on topics for which some incremental change should be attempted.

1. Implement a cost accounting system. (Vulnerability #6).

This should be IBGE wide, and include all costs. However, if this cannot be done, the Informatics Directorate should implement their own, and begin making users conscious of service costs. Initially, the

"invoices" should be handed to users by senior DI officers and the contents explained and discussed. Any indicated actions must be negotiated and this requires a mechanism, e.g. formal weekly meetings.

2. Following recommendation #1, introduce measures to reward cost saving behaviour such as overnight use of the mainframe. This will help to provide mainframe availability for participation in Client/Server developments, and address vulnerability #2 in addition to #6. See also point 7 below.

3. Develop, in collaboration with the Institute, a systematic training program for informatics professionals. This is useful both to enhance skills, and as a motivator (vulnerability #1). It will enhance the ability to absorb newer techniques depending on the pedagogical choices made.

Significant IBGE wide benefits are available from adoption of some modern technologies (see point 7 below), and their ability to deliver benefits will depend directly on the ability of staff to implement and support those technologies.

4. Propose to several users a co-location of their DEATE teams. (vulnerabilities #5, and potentially #1). This should include both development and support projects. The proposal should follow negotiations with the users regarding the objectives to be attained by co-location, and periodic follow-up to agree on progress towards the agreed objectives. Clearly one pervasive objective will be to foster a spirit of shared goals and mutual responsibility for results.

5. Appoint a senior DI officer to be responsible for relations between DI and each of its clients (vulnerability #5). This could be someone from DEATE, or a separate group, but must cover ALL services of the Directorate. The most important task of this officer will be to identify the need for project management standards and to use all efforts to engineer a proper project management structure for all developmental projects.

6. DI should convert to project management standards, commencing with a formal definition for all current and future projects. This will result in an improved appreciation of the impact of all new projects, and a clarification or confirmation of all current projects. Minimum deliverables from the definition phase of a project (see the booklet supplied on Project management) are :

- i) description of the purpose of proposed system;
- ii) initial estimate of costs, time and resources required; and
- iii) record of approval to proceed.

7. Begin a program of Client/Server(C/S) computing development, based upon international network standards, as rapidly as budgets permit (vulnerabilities #2, #3, and potentially #1).

This should not be a radical "dump the mainframe, shoot in the opposite direction" move but rather a systematic search for cost-effective applications for C/S implementation. The mainframe should remain the site for data warehousing, for most major survey "back-end" processing, and should be targeted as the responsible center for network wide system security.

New systems, using operating systems such as UNIX, and desktop systems, using UNIX, Windows and NT, can provide high productivity for interactive processes such as data analysis, Computer Assisted Software Engineering (CASE), and personal computing applications. This direction of computing, at Statistics Canada, as at many other organisations, has had the effect of fostering computer literacy across the agency, expanding the use of purchased software, and greatly increasing the range of technical choices for each application. The System Development Division has become more adept at system integration i.e. the assembly of a system, which, though entirely individual in its final configuration, includes components which are purchased, constructed in house, or reused from other systems.

The proposed installation should start by being intra-site, in order to avoid the vagaries of the telecommunications services, but with provision for inter-site communications. Mangueira should be a first site; it is essential that the mainframe be from the beginning, a vital part of the Client/Server environment at IBGE.

8. Begin negotiation with selected clients at Mangueira for potential Client/ Server system installation (Vulnerabilities #2 and #5) These negotiations should include:

applications (or components thereof) to be installed, and relationship to current mainframe systems;

conduct definition phase of conversion/installation project; and

a definition of responsibilities between DI and Client.

9. Review all costs of providing the mainframe service (vulnerability #7). This should include identifying staff who are surplus to the direct tasks of running the service; evaluating purchase rather than rental for equipment; and estimating a saving from competitive procurement practices.

Technical assistance from Statistics Canada.

The following forms of technical cooperation can be delivered in their main part if suitable financing arrangements -through the two national governments concerned, or through international organisations - are developed. Of course such matters as documentation or customer support are available at no charge.

1. Mainframe accounting. DI have developed a form of accounting for mainframe utilisation. however at Statistics Canada we have an entire methodology, including cost tracking, cost allocation and client billing. We would be willing to make the software available to IBGE, and provide consultative support, both for the installation of the software, and for the methodology of cost accounting for Informatics services.

2. We have already provided summary descriptions of Statistics Canada's General Survey Functions (GSFD) suite of software products. More detailed documentation, and licence fees thereof may be found appended to this report. Any product is, in principle available, although in some cases, a C/S implementation is necessary. The installation and use of any of Statistics Canada's products could be backed up by consultative support.

3. We have already provided the booklet ITF topic: project management. We would be willing to provide a copy of our manual on System Development Methodology, which is currently undergoing revision, upon completion; and consultative support in the use of both project management and system development methodology.

4. Client/Server development. Statistics Canada's wide experience in developing a C/S infrastructure would be available in two distinct ways. First, we are happy to provide you with documentation concerning our organisation for support of C/S computing. This support covers Local and Wide area networks; micro-computer support, including software advice and a software lending library; and support for server class computers. the latter includes operating system and utility installation and tuning, provision of UNIX shell scripts; benchmarking, and competitive acquisition of hardware, software and maintenance services.

Second, we could provide engineering resources to produce a detailed design for a Client/Server installation at, for example the Mangueira site.

SECTION V - Dissemination

Program Issues

Findings

CDDI (Centro de Documentação e Disseminação de Informações) has sole responsibility for the dissemination of all statistical and non-statistical information products and services. While statisticians in the "Diretoria de Pesquisas" have their own contacts to their users across Brazil, formal dissemination is centralized in CDDI. The only exception is the information release service to the press which is the responsibility of a communications unit in the presidents office.

CDDI has a staff of over 500 of which about half are working in the publications publishing production process (Editoração e Gráfica). All CDDI staff are located in RdJ (or close to RdJ in the case of the printing plant). Advisory staff in regional offices do not report to CDDI although CDDI coordinates their activities. CDDI and the regional offices provide the following dissemination products and services:

production, distribution, and sales of catalogued publications (e.g. Year Book);

distribution and sales of "Xerox" publications (e.g. "Indices conjunturais");

sales of electronic files; and

library services to the public and inquiries services.

Special tabulations requests have been discontinued for lack of resources.

In addition to these existing services, new electronic online and offline dissemination services are planned.

Strengths

CDDI seems to be well administered. Detailed records are kept and are available upon request (although it took little probing to get them). There is a production orientation as is required for an operations shop. A detailed 1993 annual report about the work of CDDI (70 pages) is available providing both quantitative and qualitative information. However, copies of the annual are only provided to regional offices and to the office of the President.

Senior staff in CDDI seem to be well informed about their area of concern but when asked questions of cross cutting nature the response was not always clear. While comments on the general moral in IBGE and in the government were volunteered, they did not seem to be used as an excuse not to try new things. Joint ventures with private sector companies have been started. The extension of electronic information services are envisaged. Issues in regard to copyright and licensing of information are being researched.

Vulnerabilities

These include:

minimal revenue from the sale of products and services. Year to date (6 months) revenues for 1994 are of the order of R\$11 Thousand;

lack of communications with other units in IBGE;

absence of cost accounting principles and practices to measure (or if necessary estimate) work unit and projects according to their monetary value (salary and non-salary, direct and indirect costs) and to take corrective management action;

lack of seeing marketing as the principle of satisfying clients needs at prices clients can afford and are willing to pay (currently too low, too many free copies) and at a level of revenue which recovers the costs of providing the services (currently insignificant);

lack of definition of a) what constitutes public good (free access by the public to information about Brazil

and its social and economic conditions); and b) what constitutes personal and personalized information services for which the public and institutions should pay; and

lack of specific revenue targets, or alternatively, incentives to pay more attention to client needs and revenue generation, such as making portions of the revenue available to the participating organisational units.

Most of these weaknesses can be addressed by IBGE without the assistance of Statistics Canada but Statistics Canada can assist IBGE by providing information on its dissemination policies and practices. For example, in about a years time, when the new marketing training program has been established in Statistics Canada, one or two persons could be trained in Ottawa in order to become the trainers in marketing at IBGE.

Publications

CDDI's main product is made up by publications.

From January to July 1994, 79 statistical titles covering 6 surveys were released. The following is the breakdown (print runs are shown in parenthesis):

27 state issues of Censo Demográfico 1991 (400 to 2000 with 4000 for São Paulo)

2 Sinopse preliminar do Censo Demográfico 1991 (900 and 3300)

5 1994 monthly issues of LSPA (250)

3 1993 monthly issues of LSPA Pesquisa mensal de previsão e acompanhamento (250)

2 1993 monthly issues of LSPA Prognóstico da produção agrícola 1994 (250)

1 Mapa do mercado de trabalho 1994 (2000)

1 Mercosul sinopse (1000)

1 O traço da desigualdade social (2000)

2 Regional issues of PAM 1989 "Culturas temporarias e permanentes" (300)

27 state issues of "Pesquisa de estoques" 1992 (50)

1 Pesquisa industrial 1986/1987/1988 (150)

1 PNAD 1989 (household survey) (300)

1 PNAD 1990 (500 to 800)

In addition to these statistical publications, 6 titles were released related to geography, natural resources and other topics, such as "Geografia e questão ambiental" - 1993.

This does not represent a significant publishing output for an national statistical agency. Statistics Canada, for example, publishes 1.700 issues for 280 titles annually.

Prices vary from R\$8 to R\$60 which is probably reasonable.

Bestsellers are the Year Book which is a compilation of tables (the 1993 issue is targeted for release in a couple of months) and Brazil in Numbers which is a pocket book version with tables, text, and graphs.

Publications Planning

The staff in the "Diretoria de Pesquisas" and in the "Diretoria de Geociências" determine what to publish. It is not clear how extensively CDDI is consulted or whether past performance of publications prior to decisions on new publications is taken into account. The information on sales and other distribution of individual publications by title is maintained by CDDI, but the initiative to obtain and review that information is left to the initiative of the Diretoria.

CDDI started to create a planning database covering all publications (using DBASE on a micro computer). This database contains 22 variables such as title, reference number, print run, estimated date of release, price etc. The database is to allow CDDI to plan and monitor their publishing workload. It also provides CDDI with a more rational base on which to negotiate with subject matter its annual workload and to bring demands and capacity (Editoração e gráfica) into balance. Delays in production of individual titles, because of overall workload of the publishing program and because of constant shifting of priorities and non adherence to deadlines, are a cause of considerable friction between staff working in "Diretoria de Pesquisas" and CDDI.

Publications Production

Publications production (Editoração e gráfica) seems to be well managed. While more resources such as micro computers and better access to printing material (e.g. paper and ink, which are apparently difficult to obtain in time and in sufficient quantities for printing) would of course be welcome, the use of desk top publishing software has been employed effectively (tables through Lotus and Allways, Ventura for text). Newer micro computers would help. The present micro computers are very outdated machines. (During a walk through, several were in pieces for repair). Also the Local Area Network does not function. "Diretoria de Pesquisas" has started to produce print ready pages for publications (using mainframe for large tables and micro computers for texts, graphs and small tables). CDDI designs the cover and other boiler plate information and looks after the printing, of course. This trend is well advanced in Statistics Canada.

Strengths

Staff operating the micro computer for the composition tasks were trained on the job. This demonstrates that in spite of the general problem of moral people can be allocated to, and trained for, new tasks; and

All printing is done by CDDI in its own printing plant. The plant also undertakes external printing jobs because of its expertise in printing maps. Management pays attention to printing equipment needs and their replacements and thinks in terms of cost effectiveness of what print method to use (e.g. off-set printing versus Xerox type duplication).

Vulnerabilities

There are five separate groups involved in processing a document from receiving the manuscript from authors ("Diretoria de Pesquisas") to forwarding composed and print ready pages to printing. This delays the production process. It should be investigated whether and which functions could be combined and given to fewer people and thus increase capacity by making it possible for each person to look after more than one function.

The "Diretoria de Pesquisas" does not get the opportunity to review the final print ready copies before they go to print. As they are ultimately responsible for the contents of publications it would be accepted courtesy to let them review and authorize the final version whatever the risks involved in such an operation; and

Since there is no project accounting, there are no estimates available on production costs for each individual publication. Decisions on individual publications are not based on costs.

Marketing

Vulnerabilities include:

Marketing (comercialização) is in its infancy. The knowledge of marketing principles is there and efforts are being made to conduct market research. But the thinking in terms of costs and revenues related to the principle of satisfying clients need is not yet part of the process;

Current revenues are extremely low. Revenues from sales in the 27 regional offices, through bookstores, and directly by CDDI in RdJ during the period of January to July 1994 were R\$137.000. Of that only R\$4.670 were revenues from statistical publications! Bookstores receive a 30% discount for publications sold on behalf of IBGE. However, they can return unsold copies;

Most publications are given away free or are part of an exchange program with other government department libraries. A figure of 340 copies for a typical publication was quoted. Numbers vary from publication to publication;

On the other hand, public access to publications is limited. Six libraries in RdJ provide free access to publications. In other states, citizens have to go to the IBGE regional offices. Thus in São Paulo, the largest city in Brazil, only one public library in the regional office of IBGE carries IBGE publications; and

Relevant information is not used for management decisions. CDDI keeps detailed records on sales and other disposition of publications as well as copies in stock. But this information does not seem to be used as the basis of management decisions. For example, according to CDDI, survey personnel are not interested in sales performance of their publications although the sales figures are available from CDDI upon request.

It is questionable whether it is worth marketing statistical publications in the current circumstances. The existing situation in regard to the marketing of publications begs the question whether it is worthwhile to expect revenues from the sales of statistical publications to be sufficiently high to cover the marketing cost, not to mention the production costs. The reasons for the dismal sales of publications are a combination of factors:

publications are given away freely to institutions (public and private) which otherwise would be in a position to pay for copies of publications; lack of relevance of statistics. The data are too much out of date. The accompanying analysis is of too low quality;

data are released extensively prior to publications through computer printout and computer files; and
insufficient marketing.

Xerox Publications

These are text and tables on several stapled sheets of paper. The initial print run may be 50 copies but they can be copied freely, although they have a price attached. Xerox publications are made available to institutional libraries (e.g. government departments).

The price list contains 80 items. Of these, 11 are issued monthly, 1 quarterly, 1 annually. Among the monthly are 9 which are known as "Indices conjunturais".

They include:

Sistema nacional de custos e índices da construção civil;

Índices de preços ao consumidor;

Pesquisa mensal de emprego;

Levantamento sistemático da produção agrícola;

Pesquisa industrial mensal;

Pesquisa mensal de abate de animais;

Pesquisa mensal de leite;

Produto interno bruto; and

Produção de ovos de galinha.

The Xerox publications are created by the "Diretoria de Pesquisas" on the mainframe from where they are printed by CDDI and sold, although the distribution of these publications is uncontrolled. Selected summaries of the various indices are also included in the Year Book. Prices are very low. For the "Indices conjunturais" prices range from R\$0.3 to R\$4, with R\$1.30 as average. Revenues were R\$875 from the sales of complete copies of the "Indices conjunturais" and R\$890 from sales of individual pages of Xerox publications in CDDI for the period January to June 1994. Revenues in other regional offices are estimated at 10% of the revenues in Rio de Janeiro.

This mode of dissemination can be considered simple and effective if the objective is to get the information out as soon as possible and if revenue generation is not an objective.

Electronic products

Computer tapes with aggregated data as well as micro data are being sold. CDDI is solely responsible for disseminating computer tapes after they have been created by the diretoria. Information is made available on computer tapes prior to their release in publications, for example for the 1991 Censo demográfico. This is often done because of delays in issuing the information in publications. Revenues were R\$4.620 for the period January to June 1994. Prices could not be obtained but are in all likelihood much too low.

Two new products and services are planned.

The first is a diskette (several) containing municipal profiles from the 1991 Censo demográfico. It contains 4500 municipalities and, so far, 800 variables (organized in 4 tables) resulting in a database of 20 megabytes. After the processing of the sample form of the census is completed, more variables will be added. The goal is to install this data base in all regional offices and to offer a custom retrieval service to clients who can obtain print outs of selected profiles for selected municipalities.

The interface is simple and straightforward, and works! Possible future enhancements could be: option of downloading selected data to a diskette rather than only paper; option to import selected data into commercial spreadsheet packages such that client can manipulate the data to do ratio and percentage calculations. The price is R\$1 for one profile for one municipality. This seems low but at least is consistent with the low prices of other products.

The second new product is the online system SIDRA. This is an excellent initiative developed in cooperation between "Diretoria de Informatica", "Diretoria de Pesquisas" and CDDI under the project management of a member of CDDI. Extensive meta data (information about the data) is already on the system. For example, the detailed description and definition of all variables. The system supports table views as well as time series views of the same data.

The plan is to have all the "Indices conjunturais" available in SIDRA at the time of their release to the press and the public.

It is planned to offer online access to outside users on a fee basis. There will be, no doubt technical problems, as this is an IBM mainframe system where the remote microcomputer has to simulate a 3270

terminal protocol. Also this will add workload to a machine which, apparently, has scheduling problems.

However, technical problems can be solved over time. More important is the fact that the statisticians in the "Diretoria de Pesquisas" support SIDRA. The SIDRA project demonstrates that staff in IBGE have the understanding of the needs, have the technical know-how, and can take the initiative to develop a major new approach. This is such an exemplary case of what Statistics Canada stresses in regard to management culture that it is also written up as an appendix.

The SIDRA project should get the full support of senior management to move from the development stage into the operations stage.

Special Tabulation Requests

Experience has shown that there is a significant demand for special tabulations which provide more detail or aggregate data in different formats than is available in publications or other preplanned products. This service was provided in the past but was discontinued because qualified staff has left IBGE and staff replacements could not be secured.

Custom tabulation services are a cost effective way to address clients needs and avoid the risk of producing too many preplanned tables for which specific demand can not be measured. Each service request is handled as its own business case, i.e. revenues should recover the full service costs.

The prerequisites for offering service for special tabulations and data extractions are:

micro data files organized, maintained and linked to tabulation software for easy access and submission of tabulation specifications;

staff knowledgeable in subject matter and assigned to servicing client requests; and

a cost recovery mechanism whereby the costs (material and staff expended for requests) will be paid from the revenues.

"Diretoria de Informatica" has developed a micro database management system in which, so far, the data from the PNAD and PEM surveys, and the 100% data from the "Censo demográfico" are maintained. (The database system is using the RAPID software from Statistics Canada which was obtained in the 1980's). To this have been linked two tabulation systems: SAS and an IBGE developed table generator. The micro database management system has been implemented for internal use by the "Diretoria de Pesquisa". But it has all the power and flexibility to generate special tables on demand. As well, a comprehensive meta data base has been developed which is linked to the micro databases.

CDDI need to decide where the staff should be located who will service client requests. Typically, special requests demand an intimate knowledge of the scope and limitations of the surveys and census data and in most cases that knowledge resides with the statisticians in the "Diretoria de Pesquisa". On the other hand, CDDI may have a better client service infrastructure. In any case, IBGE should re-institute this service.

Library (biblioteca) Service and Customer Inquiry Service

These services seem to be well organized and managed. The CDDI/IBGE catalogue is simple but effective. A very good feature is the listing of all surveys undertaken by IBGE. Contact points for each survey should be added.

Records are kept on number of visitors to the library at CDDI in RdJ and on number of telephone, letter and in persons requests to CDDI in RdJ. It was not clear whether similar records are kept for the CDDI services in the regional offices.

Internet

CDDI plans to make IBGE present on Internet through a GOPHER server with information about the services of IBGE. The plan seems to be reasonable (and adequately funded) and follows similar actions by other national statistical offices. (Statistics Canada operates a GOPHER node called "Talon" since March of 1994).

Dissemination in "Diretoria de Pesquisas"

An organisational unit labeled DDI is located in the "Diretoria de Pesquisas" which, with a staff of 4, is responsible for all interfaces between the eight survey areas in the "Diretoria" and CDDI in regard to dissemination.

Strengths

There seems to be good communications on a personal level between DDI, CDDI, and "Informatica" particularly in regard to the SIDRA project. DDI fully supports SIDRA and wishes to have the system operational as soon as possible.

Vulnerabilities

slow production of publications in CDDI; (as mentioned above, many publications are now composed in the "Diretoria" in cooperation with CDDI);

Xerox publications are distributed slowly; CDDI should allow regional offices to print Xerox publications off the mainframe;

CDDI does not consult DDI on decisions concerning print run of new publications;

DDI does not know the sales figures for publications; (however, upon probing they admitted that they know that the information is available and can be asked for from CDDI); and

DDI is aware of the updating problems, i.e. figures in SIDRA can be different from those in XEROX publications.

Recommendations

1. The new publications planning data base should be fully developed and made operational. Under the lead of CDDI an annual publications plan should be established and negotiated with the "Diretoria de Pesquisas". Changes in the plan and shifts in priorities should also be negotiated between the two organisations.

2. The publications planning data base should also be the operations monitoring data base in which completion dates and other actual information (if different from the planning figures) are added.

3. As resources permit, newer micro computers should be added to the publishing operations.

4. Cost accounting should be introduced such that costs for each publication are recorded. These costs consist of indirect and direct costs broken down by salary and non-salary items. Some of the costs can be measured directly, others need to be allocated according to formulae. Cost recording allows a review of the performance of individual publications (costs and revenues) and is the basis for decisions on reductions of costs globally.

5. CDDI should develop statements of cost and revenue performance for individual publications and make them available to authors.

6. Bookstores should have the choice between two types of discounts. A lower discount if they can return

unsold publications to CDDI, a higher one if they buy publications from CDDI and pay up front.

7. Time should be taken to find out why the existing sales of publications are so low. Such product evaluation and market research should be done in cooperation with the "Diretoria de Pesquisa".

8. IBGE should define a policy on publications and set targets for annual revenue-cost performance for the total publishing program. Such a policy would define what constitutes public good (free access by citizens) and what is the goal of revenue generation (e.g. revenues from all publications must cover the post manuscript production costs).

9. Xerox publications should have a consistent approach for their cover pages and reference to IBGE as the originating organization. Prices should be increased.

10. SIDRA should be declared a strategic product and be resourced adequately for its development and operation. Particular attention needs to be paid to updating of the data (correct data, timeliness) and access facilities to the data base (speed of response).

11. A dissemination strategy should be developed which ensures that other information services (inside and outside IBGE) do not undercut the potential revenues from SIDRA.

12. It should be investigated whether private information companies are interested in carrying information from SIDRA under contract with IBGE. These companies are very effective distribution channels. They have the infrastructure (hardware, software, network, support) and can market effectively additional information sets. (Statistics Canada's CANSIM time series data base is offered by 7 companies, e.g. Reuters, DRI).

13. Special tabulation request services should be reintroduced in cooperation between CDDI, "Diretoria de Pesquisas", and "Diretoria de Informatica". A corporate cost recovery policy and mechanism needs to be defined.

SECTION VI - Training at IBGE

Program Issues

Findings

Meetings were held with representatives responsible for providing training and line managers who are clients. Specifically these were with representatives from ENCE, Human Resources, Agriculture, Department of Planning and Organization., Survey Directorate and Informatics.

The National School of Statistics (ENCE) has a number of programs. The undergraduate program grants a first degree in Statistics to up to 30 graduates a year. There are about 120 students at any one time. These graduates enter the program from high school but do not end up working at IBGE. A post graduate specialization program provides 360 hours of training in theory to up to 20 students a year in one of Demography, Quantitative Analysis, Data Analysis and Sampling.

All professors at ENCE carry out research as part of their responsibility. They are encouraged to work on IBGE related issues. It is estimated that 90% relates to IBGE including the analysis carried out. Currently there is under development a program in the Production and Dissemination area of Statistical Information.

ENCE also trains some IBGE employees in computer software, basic statistics and mathematics and some in basic writing in Portuguese. In 1992 about 1000 training days, in 1993 about 1800 training days and to date in 1994 about 800 days. In addition it is planned to train an additional 250 IBGE employees who will be acquiring new equipment. There are also high school level technical programs of 360 hours for intermediate levels in Geography, Computer Systems and Basic Statistics. Up to 20 students a year

participate in this program.

ENCE has a staff complement of 85 employees: 39 senior and 46 intermediate. There are about 30 full time professors and teachers and guest lecturers from IBGE. The remaining resources are administrative staff, library staff and secretarial support. The annual budget is some 1% of the IBGE total budget. It is estimated that about two thirds of the ENCE budget is spent on the undergraduate program. Financial management is provided by the central Finance Division.

Human Resources area has some responsibility for training as it is responsible for the design and delivery of training courses related to large non recurring surveys. In such cases, funds are built into survey costing. They are also responsible for coordinating training needs and training plans with the Planning and Organizing Divisions of the various Directorates.

There is no other training provided by the Human Resources area due to a lack of funds. In the late 1980s a World Bank project funded management training to IBGEs senior managers. Once completed there were no continuing resources to maintain the programs. It is estimated that 40% of those trained have now left IBGE.

Environmental Considerations

ENCE is required to provide an undergraduate program in statistics as it is currently part of the educational system. It is within the authority of IBGE to cease the program but an attempt in the past raised a controversy externally.

The budget of IBGE is being reduced in a climate of a freeze on hiring which is public service wide. Accordingly, there are no opportunities to recruit new staff to replace 2500 recent departures stimulated by favorable retiring conditions nor to face up to shortages of a particular type of skill.

Employees of IBGE are located in 5 major locations in Rio, in 27 State Offices and 581 Agencies The ENCE building is apart from the work areas.

Recent government policy establishes that employees in the science and technology areas are eligible for salary increases of 18% after 360 hours of training. Bonuses are also received upon completion of university degrees. The impact of the new policy is largely unknown at this time.

All employees are at one of two levels: superior or intermediate. Movement across categories has come to a virtual standstill. There are promotional opportunities within levels but the increase in wages is insignificant and is not considered a reward for the amount of increased responsibility and there is little movement within work areas. Increasing training credits seems to be the only way to increase salary. New assignments are rare; there is no systematic process to facilitate movement; and there appears to be little demand by employees for movement to other jobs.

Strengths

ENCE has a good selection of professional and technical programs. These courses and programs are mostly theoretical in nature. The School provides physical facilities away from the work place and is an environment that is conducive to learning. There is a sizable staff trained in the design, delivery and administration of courses. Operational training for non recurring surveys is handled very well by the HR staff in conjunction with the appropriate subject matter staff, Planning and Organization staff and regional people. The current activities around training interviewers for the Census of Agriculture constitute an example. The current amount of money spent on training is significant: one per cent of the IBGE budget allocated to ENCE, plus the funds earmarked in the framework of the various censuses adds up to a sizable sum.

Vulnerabilities

An unbalanced curriculum. The programs at ENCE are all highly theoretical in nature. All require significant commitment of time (360 hrs) and are not readily available to IBGE staff. In addition there is a limited variety.

Sub-optimal allocation of resources. There is no policy on training and training does not appear to be one of the strategies that is being considered to better utilize the staff that currently exist.

Weaknesses in decision taking; rigidity in supplying resources. There does not appear to be a management structure in place to establish priorities ,allocate or reallocate funds or to systematically identify training needs.

Unresponsiveness to client wishes. There is no formal link between the parts of the organizations responsible (ENCE and Human Resources) and in addition there are no formal or informal consultations with the areas that need training. The Planning and Organization Divisions attached to the Directorates are to identify local training needs and communicate these to Human Resources who then are to arrange for delivery from ENCE or other sources if there are sufficient funds. This process does not seem to function effectively.

Training Issues

The current programs at ENCE concentrate only on university level training meaning that the programs are long and require a significant commitment of time.

The courses are very theoretical in nature and therefore are of interest to a limited number of people These programs are not viewed as being too helpful in providing practical tools to take back to the workplace. Accordingly, ENCE utilizes their scarce resources in a number of university level programs that reach a small number of people. Employees see ENCE as a way to collect training hours not as a way to help them do their jobs better.

ENCE could change the balance by investing some of their resources into designing shorter modular courses in a wider range of subjects that would be practical in nature. These shorter, more work related courses must be available in sufficient number that the survey areas can get their key people trained in a couple of years.

Professionals in all parts of the organization must be encouraged or be required to participate actively in all training activities. They must get involved in the design of practical courses and they must view teaching or lecturing as part of their work responsibilities. Good professionals should feel it is their responsibility to teach others about their own profession.

Several parts of the organization are involved in training and act independently of each other. These include ENCE, Human Resources, Survey Departments and Informatics. Each makes its own decisions on course content, human resource and financial allocation using local needs to determine priority and often with no consultation with the users of the training. In aggregate, this is not an ideally suited way of taking effective training decisions.

Lack of coordination often leads to training that does not meet agency wide needs and these are invariably the need to make personnel more effective and better motivated.

There is a shortage of experienced specialists. In addition, economists, sociologists, statisticians, computer systems and survey specialists all function well on their own but lines of communication seem to break down when they have to work together.

Two major strategies have been put in place at Statistics Canada to deal with these points. First, most survey work is carried out in a project team mode meaning that all types of specialists are brought together under one responsible project manager. This tends to force the members to focus on the objectives of the project rather than the individual organizational preoccupations To do this there has to be some practical

training in managing in a project environment.

In addition, to make the best use of limited professional resources it is good to try and increase the scope of knowledge that professional staff require. It is the belief at Statistics Canada that, for example, economists need practical knowledge of sampling, survey methodology, computer systems and so on, or that survey managers should have some statistics and economics. 'Multi skilling will ensure that when specialists speak to each other that they communicate and that when individual decisions are taken they are in the right context.

There is no focus on training at IBGE. The common response to issues of training is that it is useless discussing them because there is no money to follow-up on the discussions. Senior management must articulate a position on the subject so that employees in the work areas know that training is viewed as important for the continued renewal of IBGE. But concrete steps must be taken to back up the statement. For example, at Statistics Canada a senior survey manager was given the responsibility of identifying and implementing training needs for his colleagues. Acting as the training 'product champion he mobilized the variety of resources necessary to set training in motion. After the initial early and successful implementation, the ongoing program has its own momentum and is self sustaining.

A very simple statement is often enough to convey the sense of importance. A statement could cover such things as:

practical training is an important priority for IBGE in order to best utilize limited resources; and

we will look at ways to better allocate our current budget and staff in order to increase the availability of work related courses, the scope of our courses, and the relevance of our training to the needs of the management and the employees in carrying out the work of IBGE.

Recommendations

The current situation at IBGE is that there are limited professional and technical staff, no new hiring and a decreasing budget. Since management cannot change externally imposed restrictions it must aim at providing other incentives to its staff. These might include a more varied career, better practical training even if such training may entail higher wages or the loss of a well trained employee to the private sector. It is essential however that steps be taken. The alternative is that staff will sit idly by as the agency loses resources year after year and its workload commitments increase.

Training must be viewed as a major strategic direction to be taken to:

manage financial and human resources more efficiently;

improve staff productivity;

increase versatility of staff to allow them to be used where they are needed and to make more informed decisions; and

provide the opportunity for employees from different parts of the Institute to come together in a training mode to exchange ideas and experiences.

The recommendations that follow are based on some very practical steps taken at Statistics Canada, starting about 5 years ago, to deal with many of the same types of issues. Experience has shown that they have been successful. A certain degree of patience is required at the beginning until things begin to work. It is important that there be early successes in order to gain the momentum and reduce the feeling that nothing can be done. IBGE should in the short term (in the next year) initiate the following activities.

1. Prepare and communicate a statement of intention in relation to training at IBGE.

2. Identify a senior survey manager and give this person the responsibility of determining the practical training needed. This person is the 'Product Champion

3. Establish a Training Committee that reports quarterly to the President on progress and plans. The membership is important as is the amount of authority to act.

Members could be as follows: Chaired by the Director of Surveys with senior members from ENCE, Human Resources, a Regional Office, Coordination and Dissemination, and Informatics, the senior manager identified as 'Product Champion and others as required such as representatives from the various Directorates. It is important that these representatives be line managers and not entirely people from the planning offices. Employees from the non survey areas are there to support and implement the decisions of the committee

The mandate includes:

allocation of training resources;

establish training priorities;

coordinate and integrate training activities;

establish a set of guidelines to clarify training objectives;

develop an overall plan outlining the knowledge and skill requirements for each major type of job; and

implement the philosophy that all professionals are a teaching resource to be utilized by the corporation in delivering practical training to as many staff as possible.

Implementing these will put in the management structure necessary to strengthen decision making, and ensure that line managements needs are being taken into consideration when priorities are being established and courses are being designed.

4. Start to balance the curriculum by developing a Survey Skills course similar to the 6 week course at Statistics Canada. This should be developed and delivered by a team of 4 survey people working with staff from ENCE to ensure relevance and commitment This is a big step that will start to the thinking along practical training lines and if implemented within 6 months will sent the correct message to staff and other managers. At the same time, as a matter of priority, short introductory courses in survey methods, questionnaire design and sampling as examples should be designed with the survey people for their staff. This will help during the survey design activities (these do not have to be sophisticated but must be useful). See Annex VI for costs associated with this recommendations.

5. Develop in collaboration with Statistics Canada a Project Management course specifically tailored for IBGE staff at all levels.

6. IBGE should send representative(s) to Statistics Canada to investigate internal and external communications policy and mechanisms including media relations, decision making processes including management and advisory committee structures and finally the corporate planning process. As well as the operation of the STC Corporate Assignments program that has been highly successful in systematically reassigning staff to diversify there skills and develop their capabilities

7. In the longer term IBGE should consider practical training to the people who can benefit the most at first but eventually a little to a wide range of people in these areas:

survey skills for juniors;

computer software training for people as they get new equipment; and

marketing for those involved.

8. The Training Committee should explore the benefit of a formal assignment program similar to the Corporate Assignment Program at Statistics Canada. This type of program stimulates mobility, increases the skill and knowledge of staff, provides flexibility to move resources where they are most needed and provides variety and incentive to staff.

Attached as an annex is a more detailed estimation of the costs of Statistics Canada involvement in the implementation of the major recommendations.

Annex to Section V - SIDRA Project

Organisations succeed because of a multitude of factors which have become part of the organisational "culture". Among them is the understanding that staff have to be empowered to find solutions in a project environment bringing together the necessary resources as well as multi disciplinary knowledge and skills to achieve a defined and tangible goal. Among the biggest projects in any statistical organization is, of course, the conducting of a census. However, project management is necessary for smaller projects as well. While the mission has found, in general, the absence of a pervasive project management culture in IBGE, the mission would be amiss not to cite an example to the contrary to reinforce its point.

In the opinion of the mission, SIDRA is an excellent example of the apparent ability of people in IBGE to cooperate on an important project. SIDRA provides a good beginning for a corporate approach on managing the statistical information collected by IBGE for both internal (analysis) and external use (dissemination). The system has been developed in cooperation between "Pesquisa", "Informatica" and "Disseminação". The project has the following characteristics:

a common and clearly understood goal among the project supporters of and participants in the project;

personal commitment among the participants to achieve tangible results;

technical competence in designing and implementing a solution which strives towards a best concept but settles for what can be done realistically and practically;

willingness to assign resources with an attitude of flexibility rather than bureaucratic decision making;

a project manager which is recognized by all participants as the leader during the duration of the project regardless of his normal position in the hierarchy;

cooperation between organisational units ("Diretoria de Pesquisa, Informatica, CDDI") which otherwise are often remote from each other;

a willingness to compromise in the face of conflicting or too ambitious ideas; and finally

a shared vision.

Annex to Section VI - Cost of Statistics Canada Support to IBGE

The following outlines the costs of the three major recommendations in the area of training, namely:

development of a Brazilian version of the Survey Skills Development course;

collaboration on the development of an appropriate Project Management course tailored for IBGE; and

consultations at STC for IBGE representatives to investigate internal and external communications

mechanisms including media relations, decision making processes including management committee and advisory committee structures and the corporate planning process.

Recommendation 1 Cost

Statistics Canada (STC) has been providing to all its officer level staff a six week course called 'Survey Skill Development(SSDC). The purpose of the course is to foster teamwork, develop an appreciation of the multi-disciplinary approach to survey taking, and a better practical understanding of what survey taking implies. In a sense STC regards this kind of course as a key to the development of its staff and to its future.

STC proposes that IBGE develop their own Brazilian version of SSDC by using the Canadian model.

This development should be carried out in the following stages.

STC will provide IBGE all relevant documentation to the SSDC course in English and/or French. Appropriate IBGE staff (suggest a team of five, a survey manager, a statistician, a computer analyst, a specialist in Field operations and an individual familiar with course design) will review the material, translate it into Portuguese and determine what adjustments are required.

IBGE will send at least two of the team to participate in one of the Canadian courses which is 6 weeks and will remain in Canada for an additional week to investigate other course material and discuss SSDC issues relating to cost and administration with the course manager.

The IBGE team will return and develop the Brazilian version of the course by modifying the Canadian model to reflect the Brazilian circumstances.

Upon completion of the course a Canadian SSDC staff member will go to Brazil for 7 weeks, 1 week before the 'pilot course and 6 weeks to provide the necessary advice and guidance during the delivery of the first Brazilian course.

Estimated cost (Canadian \$'s)

Tuition	\$ 12000.00
Travel	\$ 9000.00
Meals and Accommodation	\$ 22,000.00
Consultant Fees	\$ 27,000.00
Total	\$ 70,000.00 (Cdn)

Recommendation 2 Cost

This recommendation requires a STC consultant to develop, in collaboration with an IBGE representative, a course in Project Management which would include all of the elements of managing large projects but tailored to IBGE needs. The consultant fees for this activity are estimated at 30,000\$ Can. The travel, accommodation and meals costs for about 3 months must be added to the consultant fees.

Recommendation 3 Cost

This recommendation suggests that a representative(s) of IBGE travel to Canada to spend about a maximum of 2 months with STC officials to investigate policies and programs in the areas specified in 3

above. In addition to the cost of travel and accommodation for IBGE staff, STC would charge a flat fee of 200\$ Can. from which overhead charges would be waived.

Notes

1. With a sample of 36,000 households, the monthly survey includes six metropolitan areas: Recife, Salvador, Belo Horizonte, Rio de Janeiro, Sao Paulo, Porto Alegre. Twenty-seven percent of the total population live in these areas.
2. For example, for the Establishment Employment Survey results are produced 50 days after the reference period. Similarly the monthly Employment Survey is carried out with results within weeks of the end of the reference period.
3. It was noted that some users bypass the Dissemination Directorate when they require information and come directly to the Program Department concerned. This may reflect either the way they have historically dealt with IBGE or may indicate their preference based on experience.
4. A "black Box" refers to a piece of computer software which carries out some function (in this case, sample survey weighting) for which there is little or no documentation or knowledge on how the software works. <